

REMARKS

Initially, Applicants would like to thank the Examiner for indicating the allowability of claims 39-44 and 47-55. Applicants would also like to thank the Examiner for his courtesy in conducting a telephone interview with Applicants' representatives, Arnold Turk and Joshua Povsner, on July 18, 2007.

In the above-noted telephone interview, Applicants' representatives discussed support in the application as filed for the features of claim 38 which the outstanding Office Action asserts are not described in the specification of the application as filed. Applicants' representatives and the Examiner also discussed the prospect of submitting a Declaration Under 37 C.F.R. 1.132 in which one or more of the inventors would declare that the application as filed supports the features of claim 38 which the Office Action asserts are not described in the specification of the patent application as filed. However, the Examiner indicated that Applicants should submit a Response discussing support in the application as filed for the features of claim 38 which the outstanding Office Action asserts are not described in the specification of the patent application as filed.

Accordingly, Applicants discuss below support in the application as filed for the features of claim 38 which the outstanding Office Action asserts are not described in the specification of the patent application as filed. Further, if the Examiner so requests, Applicants will submit a Declaration Under 37 C.F.R. 1.132 in which one or more of the inventors declare that the application as filed supports the features of claim 38 which the outstanding Office Action asserts are not described in the specification of the patent application as filed.

In the outstanding Office Action, claims 38, 45, 46, 56, 58, 59 and 61-69 are rejected

under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claim 59 is also rejected under 35 U.S.C. §112, second paragraph, as indefinite. Claims 39-44 and 47-55 are indicated to be allowable.

Upon entry of the present amendment, claim 59 will have been cancelled without prejudice to or disclaimer of the subject matter recited therein. Accordingly, the rejections of claim 59 under 35 U.S.C. §112, first paragraph and 35 U.S.C. §112, second paragraph has been rendered moot. The cancellation of claim 59 should not be considered an indication of Applicants' acquiescence as to the propriety of any outstanding rejection. Rather, Applicants have cancelled claim 59 in order to advance prosecution and obtain early allowance of the application.

Applicants traverse the rejection of claims 38, 45, 46, 56, 58 and 61-69 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The rejection of claims 38, 45, 46, 56, 58 and 61-69 under 35 U.S.C. §112, first paragraph, is based on the assertion that the specification of the patent application as filed does not provide a written description of the invention to which claim 38 is directed, and particularly of "said chamber being substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between said second fluid inlet and said first fluid inlet".

The Examiner is reminded that an adequate written description of the claimed subject matter may be shown by any description of sufficient, relevant, identifying characteristics so long as a person skilled in the art would recognize that the inventor had possession of the claimed invention. See, e.g., *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323, 56 USPQ2d 1481, 1483 (Fed. Cir. 2000). The test for compliance with §112 has always required sufficient

information in the original disclosure to show that the inventor possessed the invention at the time of the original filing. See, e.g., *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 66 USPQ2d 1429 (Fed. Cir. 2003) (citing *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1561, 19 USPQ2d 1111, 1115 (Fed. Cir. 1991)). However, even if every nuance of the claims is not explicitly described in the specification, the adequate description requirement is met if a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing. See, e.g., *Vas-Cath*, 935 F.2d at 1563, 19 USPQ2d at 1116. Also, as set forth in MPEP 2173.05(i), negative limitations are not proscribed under 35 U.S.C. §112, first paragraph. Rather, negative limitations are entertained under 35 U.S.C. §112, first paragraph, in the same manner set forth above for all other limitations.

The Abstract of the application as filed discloses a fluid mixing device (1) includes a chamber (3) and a bluff body (4) defining one end of the chamber (3), as well as a first fluid inlet (5) located toward an opposite end of the chamber (3) from the bluff body and arranged to direct fluid toward the bluff body (4). As described at page 9, lines 27-31 of the application as filed, the purpose of the bluff body is to deflect the jet inlet flow radially outwards from the axis of the device. However, it would not be possible to direct fluid from the first fluid inlet to deflect off of the bluff body if the chamber was not substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet, and this would be recognized by a skilled artisan reading the application as filed.

The application as filed also describes establishing a recirculating vortex within a chamber resulting from the mixture of fluids from the first fluid inlet and second fluid inlet(s). As described at page 4, lines 6-9 of the application as filed, the device produces a self stabilising

flow pattern which is independent of the wind direction and speed, and which requires that only one dominant flow pattern be established independent of external flow direction and speed. The consistent source of the dominant flow pattern is the first fluid inlet. However, it would not be possible to create a dominant flow pattern as consistently described in the specification of the application as filed if the chamber was not substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet, and this would be recognized by a skilled artisan reading the application as filed.

An applicant may show possession of an invention by disclosure of drawings and, in fact, drawings in a specification may provide sufficient written descriptive support for a claim limitation. See, e.g., *Vas-Cath*, 935 F.2d at 1565, 19 USPQ2d at 1118. As shown consistently in the Figures, a chamber is substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet. For example, Figure 4 explicitly discloses a flow pattern with components in directions both parallel and opposite to the jet fluid flow. The flow pattern shown in Figure 4 would not be possible if substantial fluid flow obstructions were provided in the chamber in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet, and this would be recognized by a skilled artisan reading the application as filed.

As set forth above, the application as filed supports the features of claim 38 which the Office Action asserts are not described in the specification of the patent application as filed. That is, the source of a dominant flow pattern described in the application as filed is the first fluid inlet, and a dominant flow pattern as described in the application as filed would not be created if the chamber was not substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid

flow in a region between the second fluid inlet and the first fluid inlet. Additionally, fluid from the first fluid inlet would not be directed to deflect off of the bluff body if the chamber was not substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet. Moreover, the Figures of the application as filed consistently show a chamber substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet, and the flow patterns shown in, e.g., Figure 4, would not occur if substantial fluid flow obstructions were provided extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet. In view of this and other disclosure (discussed below) in the application as filed, a skilled artisan would recognize that Applicants possessed, at the time the application was filed, a chamber substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet.

In a worst case, substantial obstructions would completely block the flow of fluid from the second fluid inlet so that the device would not function at all. Further, even partial obstruction would limit the flow of second fluid into the vortex recirculation or mixing region and prevent proper mixing. In this regard, fluid is induced through the second fluid inlet(s) due to the establishment of a low internal pressure within the chamber. The low internal pressure is generated by the high speed fluid jet from the first fluid inlet. As a result, the flow from the second fluid inlet is extremely sensitive to obstructions in the fluid flow path. Consequently, in order to achieve the mixing within the chamber, the fluid flow path from the second fluid inlet is substantially unobstructed, and a skilled artisan would recognize that Applicants possessed, at the time the

application was filed, a chamber substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet.

Additionally, the patent application as filed, and particularly at page 5, lines 1 to 19, lists modifications which are each designed to reduce the resistance to the flow of the second fluid. As such, reference to these modifications in the patent application as filed demonstrates that the chamber is substantially free of transverse obstructions, and a skilled artisan would recognize that Applicants possessed, at the time the application was filed, a chamber substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet.

Further, the patent application as filed, and particularly at page 8, lines 9 to 12, explains the formation of an internal flame adjacent the base of the flow divider. This internal flame is a beneficial result of the recirculating vortex within the chamber, and occurs at the base of the flow divider at the interface between the recirculating first fluid (fuel) and the induced second fluid (air). This flame is beneficial because it provides a pilot flame that is shielded from external wind. In the event that the external flame is extinguished the pilot flame will re-light the external flame. Relighting occurs by flame propagation from the internal pilot flame through the region between the bluff body and the flow divider to the outside of the burner. The existence of a substantial obstruction extending transversely in the chamber would prevent formation of the internal flame as described in the patent application as filed.

For the internal flame to exist, the flow pattern within the chamber must not be disrupted, and a skilled artisan would recognize that Applicants possessed, at the time the application was filed, a chamber substantially free of fluid flow obstructions extending in a direction transverse to

the jet fluid flow in a region between the second fluid inlet and the first fluid inlet. That is, a significant disruption would occur if the flow path of the second fluid (air) is deflected or restricted. Should a partial obstruction, such as a transverse obstruction that restricts flow in the direction parallel to the first fluid inlet, be placed between the first fluid inlet and second fluid inlet(s), the path of the second fluid flow would be changed, and the formation of large-scale recirculation would be impaired. Such an obstruction may (at best) have the effect of altering the maximum air/fuel ratio of the mixture in the chamber making the air/fuel mixture non-combustible and preventing the formation of the internal flame.

The burner disclosed in the application as filed is designed to introduce air into the chamber to ensure proper combustion, whether in zero cross-wind conditions or in high cross-wind conditions. For the embodiment of the burner, the zero-cross-wind condition is the condition where the minimum air flow occurs into the chamber through the second fluid inlet(s), thus leading to the lowest average air/fuel ratio within the recirculating vortex. When a cross-wind occurs, the ram-air effect forces air into the second fluid inlet(s), thereby increasing the amount and speed of air flowing into the chamber. The effect of this increased air flow is to increase the intensity of mixing and combustion within the chamber, the stability of the flow pattern and the robustness of the pilot flame. The inclusion of any substantial obstruction between the first fluid inlet and second fluid inlet(s) would, at the very least, reduce the amount and speed of the air flowing into the chamber, thus reducing the flame stability and preventing the burner from functioning as intended. Figure 19 shows a number of holes (21) in the chamber wall. The holes (21) in the chamber wall are intended to allow additional air flow into the chamber under zero-cross-wind condition, providing an additional mechanism to increase the

stability of the flow pattern and the robustness of the pilot flame. A skilled artisan would recognize that substantial obstruction in a direction transverse to the jet fluid flow would risk causing the air/fuel ratio within the chamber to become too rich to sustain combustion in zero-wind conditions, thereby preventing the burner from functioning as intended.

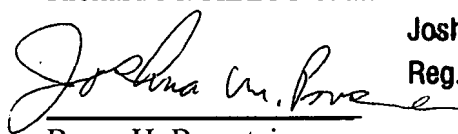
Finally, in order for the internal pilot flame to re-light the external flame, there must be a path of combustible air/fuel mixture between the internal pilot flame and the external flame. This is readily achieved for the embodiment of the burner as defined in the patent application. Thus, any restriction in the air flow by obstructions introduced between the first fluid inlet and second fluid inlet(s) will adversely alter the flow pattern and mixing within the chamber and, in turn, will have a detrimental effect on the burner's capacity to re-light. The abovementioned holes (21) in the chamber wall, which increase the air flow into the chamber, have been shown to improve the re-lighting performance of the burner. In addition, the apertures in the bluff body (see Figure 12) which are used as a means to reduce the amount of fuel that is recirculated within the burner, have also been shown to affect the re-lighting performance of the burner. The effect of an obstruction may, to some extent, be compensated by the use of these measures. However, a flow obstruction between the first fluid inlet and second fluid inlet(s) offers no benefits, and would simply lead to degraded performance. Accordingly, a skilled artisan reading the disclosure of the patent application as filed would understand that Applicants possessed, at the time the application was filed, a chamber substantially free of fluid flow obstructions extending in a direction transverse to the jet fluid flow in a region between the second fluid inlet and the first fluid inlet, in order for the fluid mixing device to function as described in the patent application as filed.

As described above, support for the above noted feature recited in claim 38 is provided either explicitly or implicitly in the application as filed. That is, as described above, the features of claim 38, which the Office Action asserts are not described in the specification of the patent application as filed, are adequately supported in the original application. Applicants particularly note that a Declaration from one or more inventors supporting the statements contained herein will be made available upon request.

At least for each and all of the reasons set forth above, Applicants respectfully submit that independent claim 38 is allowable under 35 U.S.C. §112, first paragraph. Dependent claims 45, 46, 56, 58 and 61-69 are allowable at least for depending, directly or indirectly, from an allowable independent claim, as well as for additional reasons related to their own recitations.

Should there be any comments regarding this Response of the present application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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